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10/743,315	12/23/2003	John Pretlove	43315-201410	5572

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EXAMINER	
SAUNDERS, PAUL	

ART UNIT	PAPER NUMBER
2622	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/743,315	PRETLOVE ET AL.	
	Examiner	Art Unit	
	PAUL SAUNDERS	2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 April 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7,9-20,22-28 and 30-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,9-20,22-28 and 30-33* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The amendment filed 4/24/2008 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows.

Regarding **claim 1**, the limiting phrase "and to communicate to the robot positions and orientations specified by the first specifying unit and the second specifying unit" is not found in the specification. Specifically it is not found that position and orientation of the **second** specifying unit is communicated to the robot.

Applicant is required to cancel the new matter in the reply to this Office Action.

Response to Arguments

2. The Examiner thanks the Applicant for the timely reply received on 4/24/2008. Applicant's arguments with respect to claims 1,15,28 and their dependents have been considered but are moot in view of the new ground(s) of rejection.

Claim Objections

3. **Claims 15,18,24,28** objected to because of the following informalities. Appropriate correction is required.

Regarding **claims 15,28**, it appears that it was intended to insert a comma after the phrase "displaying a view comprising the composite augmented reality image".

Regarding **claim 18**, no antecedent basis is found for the phrase "**the** movable device". Claim 18 does not depend from claim 16, however a movable device is introduced in claim 16.

Regarding **claim 24**, it depends from claim 22, then 15, wherein there is no antecedent basis found for "**the** local display device." Claim 24 does not depend from claim 23, however a local display device is defined in claim 23.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. **Claims 1-7,9-20,22-28,30,33** rejected under 35 U.S.C. 103(a) as being unpatentable over

i. Zamorano (US 2003/0179308 A1) in view of

ii. Ebersole (US 2002/0010734 A1)

iii. Rahim (US 5,155,683 A).

Regarding **claim 1**, Zamorano discloses a system for remote programming of an industrial robot (causing movement of the robot is a type of programming), the system comprising: a camera for capturing an image 121,192, the camera being movably located on the robot 125 at a local site, a registering unit 160,180 configured to generate graphics 191 and register the graphics generated by the first registering unit on the image from the camera, to provide a composite augmented reality image (fig. 1,

¶[0018, 0021-0023]), a remote display device 190 located at a remote site, for displaying a view comprising the composite augmented reality image (¶[0020]),

Zamorano does not expressly disclose a remote site physically separated from the local site, a first specifying unit configured to specify a position and an orientation in the remote site by determining a position and an orientation of the remote display device in relation to a fixed remote coordinate system wherein a position and orientation of the camera is dependent on the position and orientation specified by the first specifying unit, and wherein the first registering unit is adapted to register the generated graphics to the image in dependence on the position and orientation specified by the first specifying unit, a second specifying unit configure to specify a position and an orientation at the local site, a second registering unit configured to generate graphics and register the generated graphics on an environment at the local site or an image of the environment of the local site, in dependence on the position and the orientation specified by the second specifying unit, a local display device configured to display the environment at the local site and the graphics generated by the second registering unit projected on the environment, and a communication link configured to communicate information between the local site and the remote site, and to communicate to the robot positions and orientations specified by the first specifying unit and the second specifying unit, wherein the graphics generated by the first registering unit and second registering unit comprise information regarding movement of the robot.

Ebersole discloses an inter-networked augmented reality (AR) system broadly defined as any combination of local AR/non-AR with remote AR/non-AR (Abstract, fig.

2) wherein the system comprises a remote site physically separated from the local site (¶[0025]), a first specifying unit 33 configured to specify a position and an orientation in the remote site by determining a position and an orientation of the remote display device in relation to a fixed remote coordinate system (¶[0025] – fixed remote coordinate system being the coordinate system utilized by a GPS system) wherein a position and orientation of the camera 34d is dependent on the position and orientation specified by the first specifying unit (fig. 11, ¶[0058] – the tracking system data controls the viewing angle), and wherein the first registering unit 32 is adapted to register the generated graphics to the image in dependence on the position and orientation specified by the first specifying unit (fig. 11, ¶[0058]), a second specifying unit 33 configured to specify a position and an orientation at the local site (fig. 2, 3, ¶[0029]), a second registering unit 32 configured to generate graphics and register the generated graphics on an environment at the local site or an image of the environment of the local site, in dependence on the position and the orientation specified by the second specifying unit (¶[0034]), a local display device 32 configured to display the environment at the local site and the graphics generated by the second registering unit projected on the environment (fig. 3, ¶[0028]), and a communication link 2 configured to communicate information between the local site and the remote site, and to communicate to the robot positions and orientations specified by the first specifying unit and the second specifying unit (¶[0025, 0030, 0032, 0042-0047]). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify the robot camera taught by Zamorano to further allow the AR display device to

be remotely located and head mounted, the robot camera be remotely controlled by the tracking of the remote head mounted display, to allow a second local AR head mounted display device, and to allow a communication link to inter-link all components in order to further enhance the AR system abilities and experience (Abstract, ¶[0004]).

Rahim discloses an augmented reality system comprising wherein the graphics generated by a registering unit comprise information 12,18 regarding movement of a camera robot vehicle V (Abstract, figs. 1-5, col. 8 lines 27-44). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to modify Zamorano as viewed to further incorporate graphical information regarding movement of the robot as taught by Rahim in order to allow the viewer to review the projected path (col. 5 line 35).

Regarding **claim 2**, Zamorano as viewed discloses the system according to claim 1, wherein said first specifying unit comprises a tracking unit adapted to determine a position and orientation of a movable device located at the remote site, the first registering unit adapted to register the generated graphics on the image in dependence of the position and orientation of the movable device, and the camera is arranged such that its position and orientation are dependent on the position and orientation of the movable device (Ebbersole fig. 3, 4, 11, ¶[0058, 0059]).

Regarding **claim 3**, Zamorano as viewed discloses the system according to claim 2, wherein said movable device is the remote display device 45 (Ebbersole).

Regarding **claim 4**, Zamorano as viewed discloses the system according to claim 1, wherein the industrial robot is located at the local site, wherein the camera is mounted on the industrial robot (Zamorano fig. 1) and wherein the industrial robot is arranged in such a manner that movement of the industrial robot depends on the specified position and orientation (Ebbersole ¶[0058]).

Regarding **claim 5**, Zamorano as viewed discloses The system according to claim 1, further comprising a graphical generator configured to generate a graphical representation, wherein the registering unit is adapted to generate graphics based on the graphical representation (Ebersole figs. 6-8, 10, page 2 ¶[0028]).

Regarding **claim 6**, Zamorano as viewed discloses the system according to claim 1, further comprising operator input means 35 located at the remote site and configured to feed data related to the graphics to be displayed to the system, wherein the system is adapted to generate the graphics based on said data (Ebersole fig. 3, 4, 6, ¶[0039]).

Regarding **claim 7**, Zamorano as viewed discloses the system according to claim 6, wherein said operator input means comprises a pointing device and a tracking unit configured to determine a position of the pointing device and wherein the system is adapted to generate a graphical representation of a point pointed out by the pointing

member based on the position of the pointing device (Ebersole ¶[0031, 0050] – graphical representation being an AR pointer).

Regarding **claim 9**, Zamorano as viewed discloses the system according to claim 1, further comprising a second movable device 47 located at the local site, wherein the second specifying unit comprises a second tracking unit to determine the position and the orientation of the second movable device (Ebbersole figs. 2-4).

Regarding **claim 10**, Zamorano as viewed discloses the system according to claim 9, wherein said second movable device is the local display device 47 (Ebbersole).

Regarding **claim 11**, Zamorano as viewed discloses the system according claim 9, further comprising a second camera 34a for capturing an image, the camera being arranged in a fix relation to the second movable device 45, and wherein the second registering unit is adapted to register the generated graphics generated by the second registering unit to the image from the second camera, to provide a composite augmented reality image, and wherein the local display device 45 is adapted to display a view comprising the composite augmented reality image (fig. 3, 4, ¶[0030]).

Regarding **claim 12**, Zamorano as viewed discloses the system according to claim 1, wherein the remote display device is adapted to display a view seen from a first visual angle that depends on the position and orientation received from the first

specifying unit and wherein the local display device is adapted to display the same view as the remote display device seen from a second visual angle that depends on the position and orientation received from the second specifying unit (Ebbersole Title, Abstract, page 5 ¶[0057] – internetworked AR).

Regarding **claim 13**, Zamorano as viewed discloses the system according to claim 1, further comprising means for transferring voices between the remote and the local site via the communication link (Ebbersole ¶[0025, 0060]).

Regarding **claim 14**, Zamorano as viewed discloses the system according to claim 1, wherein the communication link comprises a network (Ebbersole fig. 1, ¶[0032]).

Regarding **claim 15**, Zamorano as viewed (refer to the rejection of claim 1) discloses a method for remote programming of an industrial robot by remotely displaying an augmented reality view comprising graphical information overlaid an image captured at a local site, the method comprising: specifying a position and an orientation at a remote site that is physically separated from the local site with a tracking unit carried by or arranged on an operator at the remote site, positioning and orienting the robot such that a camera arranged on the robot assumes the specified position and orientation, obtaining an image from the camera, generating first graphics, generating a composite augmented reality image with a registering unit based on the image, the

generated first graphics, and the specified position and orientation, displaying a view comprising the composite augmented reality image, specifying a position and an orientation in the local site, displaying a second view comprising an environment of the local site and the generated first graphics projected on the environment in dependence of the locally specified position and orientation, and controlling movements of the robot at the local site and teaching the robot one or more waypoints to carry out a task (Rahim col. 7 lines 14-26 – teaching being instructed, task being a proposed movement).

Regarding **claim 16**, Zamorano as viewed discloses the method according to claim 15, wherein specifying a position and an orientation comprises determining a position and an orientation of a movable device located at the remote site and wherein the camera is positioned and oriented according to the position and orientation of the movable device (Ebbersole fig. 3, 4, 11, ¶[0058, 0059]).

Regarding **claim 17**, Zamorano as viewed discloses the method according to claim 16, wherein said movable device comprises a remote display device and wherein said view comprising the composite augmented reality image is displayed on the remote display device (Ebbersole fig. 3, ¶[0028]).

Regarding **claim 18**, Zamorano as viewed discloses the method according to claim 15, wherein the camera is mounted on the robot (Zamorano fig. 1), the method

further comprising controlling movements of the robot according to the position and orientation of the movable device (Ebbersole ¶[0058]).

Regarding **claim 19**, Zamorano as viewed discloses the method according to claim 15, further comprising obtaining data related to the generated first graphics to be displayed, and generating the first graphics based on said data (Ebbersole fig. 3, 4, 6, ¶[0039]).

Regarding **claim 20**, Zamorano as viewed discloses the method according to claim 15, further comprising receiving information about the position of a pointing device and generating first graphics representing a point pointed out by the pointing member, based on the position of the pointing device (¶[0031, 0050] – first graphics being an AR pointer).

Regarding **claim 22**, Zamorano as viewed discloses the method according to claim 15, wherein specifying a position and an orientation in the local site comprises determining a position and an orientation of a second movable device located at the local site (Ebbersole figs. 2-4, page 2 ¶[0029]).

Regarding **claim 23**, Zamorano as viewed discloses the method according to claim 22, wherein the second movable device 45 comprises a local display device and

wherein said second view, comprising the environment of the local site and the graphics, is displayed on the local display device (Ebbersole figs. 2-4, ¶[0029]).

Regarding **claim 24**, Zamorano as viewed discloses (refer to Ebbersole) the method according to claim 22, further comprising capturing an image from a second camera 34a being arranged in a fixed relation to the second movable device 45 (fig. 4), registering the generated graphics on the image from the second camera, to provide a composite augmented reality image, and displaying a view comprising the composite augmented reality image on the local display device 45 (fig. 3, 4, ¶[0030]).

Regarding **claim 25**, Zamorano as viewed discloses the method according to claim 15, further comprising generating second graphics and displaying the second view comprising the environment of the local site and the second graphics projected on the environment in dependence of the specified position and orientation (Ebbersole fig. 3, ¶[0028, 0034, 0040]).

Regarding **claim 26**, Zamorano as viewed discloses (refer to Ebbersole) the method according to claim 25, further comprising generating a local graphical representation, generating a remote graphical representation, transferring the local and remote graphical representations between the local and the remote site (fig. 1, page 3 ¶[0032]), generating the remote first graphics based on the local and the remote graphical representation, and generating the second graphics based on the local and

the remote graphical representation (¶[0037, 0042-0047, 0058-0060] – the collaboration of textual messages involves local and remote graphical representations in the form of text wherein when displayed they become a part of the local and remote graphics).

Regarding **claim 27**, Zamorano as viewed discloses the method according to claim 15, wherein the view displayed at the remote site comprises the environment of the local site and the overlaid graphics seen from an visual angle that depends on the position and orientation specified in the remote site and the view displayed in the local site comprises the environment of the local site and the overlaid graphics seen from an visual angle that depends on the position and orientation specified in the local site (Ebersole Title, Abstract, ¶[0057]).

Regarding **claim 28**, Zamorano as viewed (refer to the rejection of claim 15) discloses a computer program product (Ebersole fig. 2, 3, ¶[0027], Appendix A), comprising: a computer readable medium; and computer program instructions recorded on the computer readable medium and executable by a processor for performing a method for remote programming of an industrial robot by remotely displaying an augmented reality view comprising graphical information overlaid an image captured at a local site, the method comprising specifying a position and an orientation at a remote site that is physically separated from the local site with a tracking unit carried by or arranged on an operator at the remote site, positioning and orienting a camera, located at the local site, according to the specified position and orientation, obtaining an image

from the camera, generating first graphics, generating a composite augmented reality image with a registering unit based on the image, the generated first graphics, and the specified position and orientation, displaying a view comprising the composite augmented reality image, specifying a position and an orientation in the local site, displaying a second view comprising an environment of the local site and the generated first graphics projected on the environment in dependence of the locally specified position and orientation, and controlling movements of the robot at the local site and teaching the robot one or more waypoints to carry out a task.

Regarding **claim 30**, Zamorano as viewed discloses use of a system according to claim 1 for remote programming of an industrial robot by controlling movements of the robot at the local site and teaching the robot one or more waypoints to carry out a task (Rahim col. 7 lines 14-26 – teaching being instructed, task being a proposed movement).

Regarding **claim 33**, Zamorano as viewed discloses use of the system according to claim 1 for a paint application (fig. 10, ¶[0051-0053]).

6. **Claims 31-32** rejected under 35 U.S.C. 103(a) as being unpatentable over

   i. Zamorano (US 2003/0179308 A1) in view of

   ii. Ebersole (US 2002/0010734 A1)

iii. Rahim (US 5,155,683 A)

as applied to claim 11 above, and further in view of

iv. Ellenby (US 5,815,411 A).

Regarding **claim 31**, Zamorano as viewed does not expressly disclose the system according to claim 11, further comprising a handheld display device comprising the display member and the camera.

Ellenby discloses the system according to claim 11, further comprising a handheld display device (fig. 1) comprising the display member 13 and the camera 9 (figs. 1-4 – binoculars being handheld). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to allow the head mounted displays taught by Zamorano as viewed to be a handheld tracked display as taught by Ellenby in order to offer the user a preferred method of viewing (col. 3 line 63, col. 9 lines 47-51).

Regarding **claim 32**, Ellenby discloses the system according to claim 31, wherein the handheld display device is arranged so that the user seems to look directly through the display (col. 9 lines 47-51, Claim 4).

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Dalziel (US 5,579,444) teaches a programmed industrial robot arm with camera.

Corby (US 5,706,195) teaches an augmented reality system.

Milgram (July 1995) teaches remote robot programming with augmented reality.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL SAUNDERS whose telephone number is (571)270-3319. The examiner can normally be reached on Mon-Thur 9am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, NgocYen Vu can be reached on 571.272.7320. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PS/
7/17/2008

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